

# The Transformation of Marine Aviation Logistics

by Col Pierre C. Garant

*Marine aviation logistics is undergoing a sea change in order to solve root problems of aviation logistics and ensure that Marine aviation units have the necessary logistics support wherever they are located.*

To transform a culture is not a simple undertaking. This is especially true for the Marine Corps that has a culture rich in tradition and heritage. For Marine aviation logistics, the use of a central approach in providing logistics for the aviation combat element (ACE) has worked for the past 25 years, including our strong performance in the Iraq war. However, though the world has changed dramatically since the fall of the Berlin Wall, Marine aviation logistics has not.

## Why Change?

We must respond better and faster to ever-increasing operational requirements. Marching orders for Marines are clear—the Commandant's direction for transformation is toward expeditionary maneuver warfare (EMW) and seabasing.

In the profession of logistics, things are moving quickly. Opportunities in the form of emerging technologies and modern-day ideas are almost too numerous to recognize and fast-moving to grasp. Meanwhile, aviation logisticians are focused on a host of challenges they must overcome in order to fight today's wars with legacy systems and methods. The bottom line is that logistics will be a crucial factor in future conflicts as a constraint or as a force multiplier. The choice as to what logistics will be is in the hands of those who lead. Leadership must make that choice now.

## The Transformation of Aviation Logistics

The Marine aviation logistics support program (MALSP)—a proven model for 25 years—provides a point of

departure for moving ahead. Much has changed since MALSP was adopted—change should posture its replacement to adapt to the future. Without question many things can be done to change MALSP—new technical bells and whistles can increase velocity of cycles, lean transport flows, enable seamless and reliable communications, or enhance visibility. The real question becomes, when incorporating potential improvements, in the final analysis, what has really been gained? The transformation for Marine aviation logistics is defined by three key pillars.

- Purposeful change. The transformation is not change; it is change for the better. Change must create greater combat effectiveness.
- New think. The transformation hinges on a new mindset and philosophy. By taking an alternative view and approach, leaders may better solve complex problems, such as dealing with the complexities of expeditionary logistics.
- Culture shift. The transformation is a shift of something fundamental and important—something at the core of our culture. The intent is not to harvest today's "low-hanging fruit." The shift will bear new fruit.

Combining the three pillars provides a guide for what to do, where to go, and how modern-day concepts and technologies can fit in. The Marines of the aviation logistics community have charted a course for their future.

## Pillar One: Purposeful Change

Transformation of logistics means being able to respond to future bat-

tlefield requirements far better than we can today. It means confidently and reliably providing the right item to the warfighter at the right place and time. It means being able to adapt to a fluid and complex environment with reliable support that is also agile and flexible. To fit within and enable EMW and seabasing it means that logistics must be able to quickly and effectively deploy, employ, sustain, and redeploy with the ACE. How feasible and far off are these future needs for aviation logistics?

During Operation IRAQI FREEDOM (OIF), aviation logistics enabled a remarkable combat flying tempo covering a wide geographic area. Although the cornerstone of this success was the core doctrine of MALSP, its execution exposed many shortcomings and challenges. Recently, the Aviation Logistics Operational Advisory Group (OAG) conducted an in-depth analysis of the performance of aviation logis-

### MALSP of Today

In Iraq MALSP allowed aviation logistics to rapidly task organize support as needed by the ACE's operational concept. Predetermined, fixed intermediate-level logistical support packages—contingency support packages, fly-in support packages, and remote expeditionary support packages, each comprised of people, spare parts, facilities, and equipment—were brought together to form the ACE's logistics solution. Operating predominantly from a family of seabased platforms, MALSP supported and sustained the task-organized mix of aircraft throughout the combat period.



tics in OIF. The assessment began with a raw collection of problems and challenges. (See Figure 1.) There is a clear gap between today's reality and tomorrow's needs. For aviation logistics to substantially close the gap requires a bold and new approach.

### Pillar Two: New Thinking Approach

The challenges and problems experienced in OIF are not new or unique. In fact, having faced some very similar and seemingly chronic issues in previous wars and deployments, we should assume that the same list will reappear in the future unless something dramatic causes a change. The new thinking processes of the aviation logistics transformation changes the approach. First, eliminating such problems is best accomplished by identifying and eliminating their root cause, and second, eliminating the root cause is a difficult task that requires a creative and bold set of ideas and initiatives.

• *Identify root cause.* The problems collected from OIF were not viewed (or attempted to be solved) in isolation; rather, these problems were mapped in a strategic construct of logical cause and effect in order to uncover the root cause. What became apparent through the analysis is that many of the problems were the resulting symptoms of well-intending and talented Marines coping with the chaos and uncertainty that surrounds them. "Murphy" is forever lurking, and Marine leaders must always be prepared to deal with him. Murphy drives most of the undesirable logistical behaviors for a military organization either in the combat environment or in preparing for combat. Examples of coping mechanisms are "just in case" stockpiles, exaggerated time estimates, and overly protective behaviors. The accumulation of these behaviors tends to destabilize the entire logistics system no matter how well-designed the system may be. Ultimately, an inability to deal with the uncertainty and variability in a high-risk and fluid environment is what causes military leaders to carry more than they need.

## Problems experienced in OIF.

### Are these problems fairly typical?

- Intratheater distribution planning and execution of retrograde and repaired parts and equipment was poor.
- Lack of data interfaces between systems degraded ability to track and coordinate material movement in theater.
- Units deployed redundant repair capability.
- There were requisition mismatches between ashore and afloat material management systems.
- Replenishment of pickups took too long.
- Error-prone material management (requirements, transport, planning, movement) resulted in "not in stock" conditions.
- Critical shipments of expedited aviation peculiar material and support equipment were frustrated at several key nodes.
- Retrograde movement of unserviceable engines took too long to enter the repair cycle.
- Gear was misplaced.

Figure 1.

• *Eliminate root cause.* Resolving the root cause needed a creative and bold set of ideas and initiatives—a better and robust solution set for dealing with variability, uncertainty, and unpredictability. It is not enough to expect that technology will provide the answer for dealing with uncertainty. What is needed is a fundamental shift in how to confront Murphy in every aspect of the business of expeditionary aviation logistics.

### Pillar Three: Fundamental Shift

The core driver of our shift from MALSP to MALSP II is a comprehensive solution to the ever-present military logistics dilemma—how much is just the right amount to cover for variability, uncertainty, and unpredictability, and to stay ahead of Murphy. With the redesign of MALSP to MALSP II comes a combination of new processes, new concepts, new policies, new

roles, and new opportunities. With MALSP II, technology takes its proper place—as an enabler within a new thinking framework and operating architecture.

Merging the tenets of these three pillars creates the opportunity for the aviation logistics leadership to confront their core constraint and turn it on its head—the end state of the shift is the product called MALSP II. Exactly what is MALSP II, and how does it offer a better future logistics system?

### MALSP II

MALSP II is the aviation logistics future support system. Our vision is that MALSP II will provide lighter, smaller, and more effective support packages; introduce a new methodology for better and continuous tailoring of the support packages; establish a proactive logistics support system of early warning protections and controls; and afford a better understanding of capacity needed for sustainment and surge. MALSP II will increase the performance of aviation logistics as a system to improve support to the warfighter. (See Figure 2.)

The key features of MALSP II are increased agility, enhanced flexibility, better responsiveness, a proactive and stable system, ability to surge and sustain, and an adaptive model.

*Agility.* Increased agility is achieved by the redesign of con-

## Transformation of MALSP

### From this. . .

### . . .to this

Push system	Responsive, demand pull
Days-of-usage depth	"Time buffer" depth
Fixed allowance resource packages	Dynamic and flexible packages
Large footprint	Agile footprint
Reactive system	Proactive system

Figure 2.

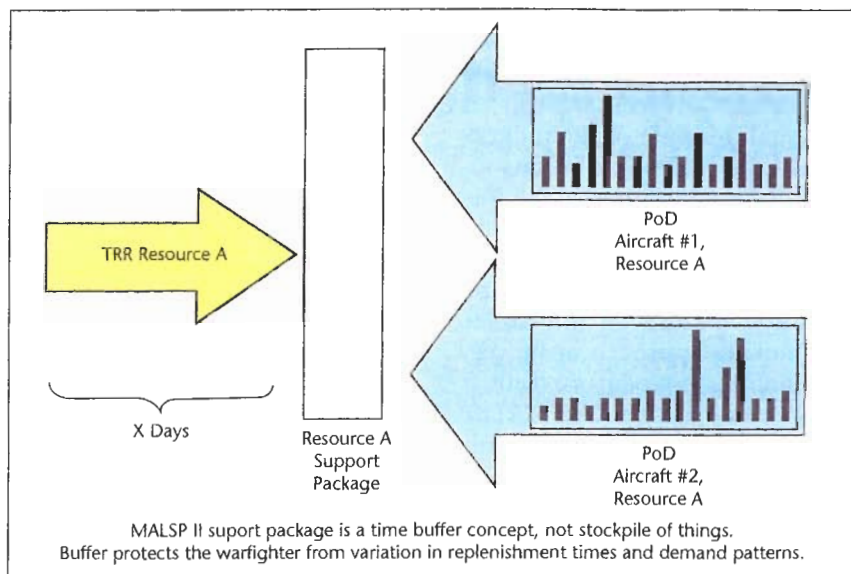


Figure 3.

tingency support packages (see Figure 3) that are positioned closest to the warfighter. The new construct of the package combines two key elements.

- The “pattern of demand” (PoD) (all the peaks, spikes, valleys, etc.) of the things that the warfighter will likely consume or need. The pattern tells us more than normalized averages we apply in today’s calculations.
- The “time to reliably replenish” (TRR) is the worst case of how much time elapses to replenish a thing (materials, resources, etc.) back in to the support package (considers all events in an interdependent chain).

Taking the worst case of these two elements, the amount of material in the support package is determined by asking, “what is the worst case (highest aggregation of PoD) of demand that must be satisfied during the worst-case length of time (longest TRR) it will take to replenish the support package?” Though it may seem counterintuitive, these new support packages are smaller than those we construct today. More important, these packages are better able to satisfy the worst-case warfighter’s resource needs. The central and new idea is that these packages should be thought of as time buffers—protecting the warfighter against the “shock” of demand variation and replenishment variation—rather than as “stockpiles of things.”

**Flexibility.** Support packages are no longer “fixed allowance” entities. They are continuously reshaped with a clearer understanding and diligent application of TRR and PoD. This methodology creates an improved opportunity to rapidly right-size resources based on specific scenarios—that is, how factors such as geographic dispersion, environmental conditions, combat consumption rates, replenishment modes, and schemes affect TRR and PoD. Resource support packages can be dynamically reshaped based on a continuous measurement of TRR and PoD; furthermore, logistical improvements (footprint reductions, increased safety, or confidence, etc.) can be gained by focusing on TRR and/or PoD. As adjustments are made in either TRR and/or PoD, packages are reshaped with an expected connection to the logistical performance of the package.

**Responsiveness.** The operation of the overall MALSP II system, functioning on a demand-pull set of rules and flows, is what increases responsiveness to warfighter needs (response times, fill rates, etc.). The critical link in the chain is the demand pattern of the warfighter. The warfighter’s demand pattern drives the makeup and the actions of the entire system. The support packages nearest to warfighters are “backed up” by a supporting chain of similarly constructed resource support packages (based on a combination of TRR and PoD) placed at strategic nodes. The operation of the system is triggered by the demand of the warfighter that sets off an integrated series of actions upstream; each node responds to the demand-pull of the node that it is designed to support. Information and material flows occur frequently (realtime or batched daily) from point of consumption to point of origin (source of supply); the performance increase is seen when each node is properly constructed (worst-case TRR and PoD) and when demand-pull flows (both information and material) are enforced. This pull-oriented system drives fundamental changes strategically through a revamped global distribution model with changes to wholesale and retail stock policies. It does so tactically, though changes in how maintenance and supply work flows occur at the shop level. Responsiveness is gained when the local and global actions are better aligned to the goal of the system—effective delivery to the warfighter.

**Proactive focus.** MALSP II creates a tremendous opportunity for leaders to be proactive—acting in modes to create success rather than as “fire-fighters.” (See Figure 4.) Recalling

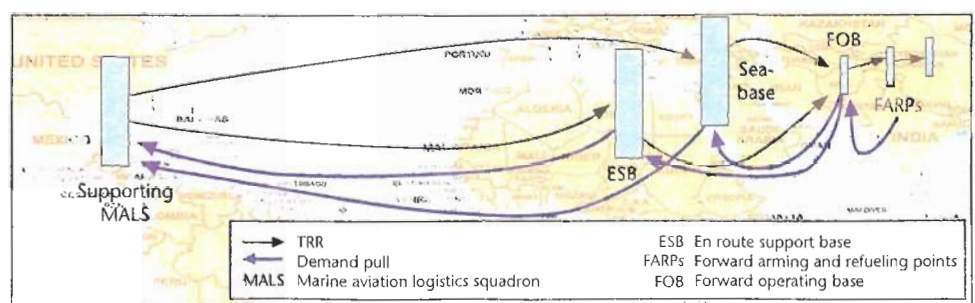


Figure 4. MALSP II laydown.



that each of the packages is now thought to be a time buffer, the total system of buffers—each of which inherently accounts for the worst-case variation—creates an alternative view of “safety” and defines new decision-making processes.

- **Safety factors.** Safety that was previously “hidden” throughout the system (each person in the system naturally creates his own safety layers) is now exposed, aggregated, and repositioned where it can best protect the overall system. As an example, safety factors previously assumed to be needed close to the warfighter—such as just in case spares or skill sets—are now relocated strategically where they have a greater likelihood to succeed in responding to the many local urgent and unpredictable situations that will naturally arise in the chaos of reality.

- **Managing by the buffer concept.** Creating planning and action decision thresholds at each of the support nodes (buffers), MALSP II enables leaders to control stability of the entire support system. The series of control mechanisms will (1) identify emerging “threatening” situations (threatening in the sense of potential to compromise the ultimate goal of guaranteed delivery to the warfighter), (2) provide an overall picture of the stability of the entire support system, and (3) point leadership to a potential “troublemaker” or emerging weak link that may need attention in the overall system.

Although not completely predictive, the MALSP II system of buffers forms a forward-looking picture so that leaders can shift into a proactive mode of thinking and behaving. In addition, the MALSP II architecture shows us how we can rapidly insert and fully optimize true predictive tools we expect to see in the near future—on-board weapons systems prognostics and sensors, intelligent software agents that optimize squadron maintenance and operations forecasts.

**Sustainability and surge capacity.** The MALSP II system creates a better understanding of the capacity and interdependencies of each node in relation to the performance goal of the overall

system. This understanding enables a new strategic decisionmaking analysis when addressing what might otherwise be viewed as excess capacity. A fundamental principle of the philosophy entails not “leaning out” any capacity until it is understood in the context of surge and sustainment capability, now and in the future.

**Adaptability.** MALSP II is an adaptable solution because it is fundamentally a thinking approach at its very foundation. It is not platform-centric or software dependent. The MALSP II framework, philosophy, and thinking processes provide the open “cognitive framework” to rapidly recognize and accept new ideas, and it has the operational agility to respond to important strategic situations.

The MALSP II operating architecture will fit into future warfighting and logistics concepts such as seabasing and EMW. Furthermore, it will posture Marine aviation to be able to bridge emerging software technologies, such as the outputs of unit-level optimizing and forecasting tools, to the global logistics support chain. MALSP II will be able to rapidly and reliably respond to improved forecasts, the predictive signals, and the demand patterns originating on the flightline or from the onboard autonomous and prognostic sensors inside future aircraft platforms during flight. The relationship between modern platforms such as the Joint Strike Fighter and MALSP II appears to be a synergistic opportunity.

### The Transformation Roadmap

The Aviation Logistics OAG has adopted a transformation roadmap with the main purpose of providing the leadership needed to cause the transition. The transformation roadmap is the mechanism that ties it all together—it connects actions to accelerate movement to better the future and enables us to balance the urgent needs of today with the seemingly distant requirements of tomorrow.

The transformation for aviation logistics is now underway. Fundamental changes to methods and policies are being designed and implemented primarily starting with the

F/A-18 community. As Marine aviation operates within the naval aviation logistics system, new operating features of MALSP II are derived from the business transformation of the naval aviation logistics enterprise—called “AIRSPeed.” Changes to thinking and previously unchallenged notions, such as those that drive our basic allowance computations and repair methodologies, are taught with the use of simulations.

The details of the roadmap address all aspects of doctrine, organization, training, materiel, leadership, personnel, and facilities and also chart out contingency and prerequisite plans to overcome obstacles, potential negative unintended consequences and side effects, and the risk of the transition to the future.

### Leadership Is the Key to Success

While the Marine Corps’ culture is characterized by a sense of deep pride in things that will not change, it has also been the Marine ethos to innovate and reshape when it makes us far better as warfighters. MALSP II is about better warfighting for today and the future.

In aviation logistics we have grown up in a culture where we have come to expect certain things. We expect that things will break. We expect far less than perfection in our logistics systems. The vision of MALSP II begins with changing such expectations.

There are certain to be difficult times ahead as we make this culture shift. The key to the success of MALSP II will be leadership. As Marines we have always taken greatest pride in our talent as leaders. With MALSP II transformation we have the opportunity once again to prove our salt.

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